**Adapted Lesson: Water Conservation**

**Subject:** ELA/Science

**Grade:**  5

**Time:** 45 minutes

**Teaching Point**: Students will understand the need for water conservation due to limited water supply and explore strategies for conserving water at home.

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| **CCSS:** Reading Informational: RI 5.1, 5.2, 5.3, 5.6, 5.7, 5.9 Writing Opinion: W 5.1 a-e, W 5.5, W 5.8  **Teacher Objectives (Danielson):**  1E: Designing Coherent Instruction  2A: Creating an Environment of Respect and Rapport 3B: Using Questioning and Discussion Techniques 3C: Engaging Students in Learning  **Bloom’s Taxonomy**  1. **Knowledge**- Students will be able to demonstrate and understanding of ways that water is wasted.  2. **Comprehension-** Students will be able to give examples of ways to conserve water. |

**Materials:** Two 2-liter bottles full of water, Food coloring (dark color preferable), Measuring cups (for measuring amounts ranging from 50 ml to 14.5 ml), Five clear containers (to hold water ranging in volume from 1,950 ml to 0.5 ml), Markers and tape for making labels, Map of your local watershed (See [Surf Your Watershed](http://cfpub1.epa.gov/surf/locate/index.cfm) for maps), Notebooks for student work  
Multimedia Resources

[Surf Your Watershed](http://cfpub1.epa.gov/surf/locate/index.cfm): http://cfpub1.epa.gov/surf/locate/index.cfm  
[Global Water Distribution](http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.waterdist/) Flash Interactive: http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.waterdist/global-water-distribution/  
[Water Treatment Plant](http://www.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.h2otreatment/) QuickTime Video: http://www.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.h2otreatment/  
[Conserving Water at Home](http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.conserve/) QuickTime Video: http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.conserve/conserving-water-at-home/

**Lesson  
Connection**  
*Pose the Question:* What percentage of Earth's water is available for human consumption? Have students write down their answers.  
Tell the class that the bottle represents all of the water on Earth. Ask a volunteer to demonstrate his or her answer to the question by pouring the amount of water that he or she thinks represents the percentage of Earth’s water available for human use into the empty container (provide the student with a measuring cup if needed.) Have the class make suggestions about whether more or less water needs to be in the container. Have the volunteer adjust the amount until there is a general consensus among the students. Put the class estimate (the clear container with water) aside.

Next, demonstrate the amount of water on Earth that is available for human consumption.

Show students the second 2-liter bottle filled with colored water and tell them that the bottle represents all of the water on Earth.

* Measure out 1,950 ml of the water Label the container SALT WATER. Tell students that this represents how much of our planet's water is found in oceans — 97%.
* Pour the remaining 50 ml from the bottle into another container, and tell students that this represents the amount of fresh water on Earth — 3%.
* Measure 35 ml of the fresh water into another container. Label the container ICE CAPS.
* Now measure 14.5 ml of the fresh water into another container. Label the container AIR, SOIL, AND UNDERGROUND.

There should be about 0.5 ml of water left in the fresh water container. Hold this up and explain that this represents all of the fresh water available for human use. Less than 1% of all water on Earth is available for consumption.

**Give students the** [**Global Water Distribution**](http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.waterdist/) **Flash Interactive to analyze in groups or with partners. This will reinforce the presentation they just saw.**

**Teaching:**   
Divide the class into small groups and have them discuss the demonstration and information they learned from the Global Water Distribution Flash. Students should use the guiding questions below to lead their discussion.

* Where is usable water located?
* Is this water a renewable resource?

1. Have a whole class discussion giving students a chance to share their ideas.

Answer: water is necessary for life and important to conserve and maintain so that it stays available for human, plant, and animal consumption.

Divide the class into small groups and have them discuss the demonstration and information they learned from the Global Water Distribution Flash. Students should use the guiding questions below to lead their discussion.

* Where is usable water located?
* Is this water a renewable resource?

2. Watch the [Water Treatment Plant](http://www.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.h2otreatment/) QuickTime Video and discuss the methods used to purify water for human consumption. Display the guiding questions below to help students:

* Why is it important to treat the water before sending it to homes?
* What do you think the brown sludge is made of? What other things do you think are removed from water to make it safe for drinking?

3. Show the map of your local watershed. Help students trace the path of water to their school. Discuss the following questions:

* Where does the water originate and how is it managed along the way?
* How is the water treated after it leaves the school as wastewater?
* Where do you think the water treatment plants are located?

**Active Engagement**  
Ask students to estimate the amount of water that they and their families typically use in a week.

Show the [Conserving Water at Home](http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.conserve/) QuickTime Video. Discuss water conservation techniques that people can use to decrease the waste and pollution of our water resources. Provide students with the following guiding questions to help with their thinking:

* An average family uses about 300 gallons of water per day. What are some of the best ways to conserve water?
* What is "gray water" and how can it be used to help conserve water?
* What is Xeriscape landscaping and how can it help conserve water?

Split the class into small groups again and ask them to brainstorm ways that they and their families can conserve water (using a Circle Map.)

**Share:** After the small-group discussions, bring the class back together and ask each group to share their top three ideas with the class.  
  
**Assessment:** Students will be assessed through informal teacher observation, collection of student work, and graded homework

**Differentiation**ESL-When reviewing directions with the class write directions on the board and provide picture support  
Show examples of what you expect from the students.   
Provide extra time to complete assignments  
Provide one-on-one time, or group assistance in brainstorming, writing, and creation phase of students.  
Instead of writing a short paragraph for reflection, consider having student write a few sentences or make an illustration.

Enrich- Create graphs or charts with statistical research found within group  
Lead students in the thought process of the script for their advertisements  
Allow students to generate a school plan to decrease waste.

**Homework:** Have each student write an article sharing his or her ideas about the topics below. Students must include information they learned from the multimedia resources during the lesson. Students can also use additional resources for their writing piece.

* Importance of conserving water and techniques for reducing water use at home
* Positive and negative effects of dams and techniques that big cities can implement to eliminate the need for dams